

b) **Figure 30(c):** — not entered

Second, Figure 30(c) illustrates an embodiment wherein the EEPROM 14 is located on the data receiving side separated from the portable key unit K and wherein fingerprint encoding and fingerprint matching are carried out by the portable key unit K but not fingerprint registration. Support for Figure 30(c) is specifically set forth in the originally-filed application when the Applicant further notes in connection with the above-quoted passage from page 51, lines 7-14 (now shown by Figure 30(b)) that:

The system can also be set up in a way that the card K carries out only the fingerprint code preparation and matching processes and not the fingerprint registration. (See Application, page 51, lines 14-19 (emphasis added))

Further, Applicant notes that in such situations where both sides are sending and receiving data, the data transmission units 24 and 25 should be data transceivers. (See Application, page 51, line 29 – page 52, line 1). Because Applicant clearly sets forth the content of Figure 30(c) in the application, the addition of Figure 30(c) does not constitute new matter.

c) **Figure 30(d):** — not entered

Third, Figure 30(d) illustrates an embodiment wherein the portable key unit K includes fingerprint match processing but not the sensor, not the EEPROM 14, not the processing for fingerprint encoding, and not the processing for fingerprint registration. With the sensor being separated from the portable key unit K, the processing used for fingerprint encoding need not be present in the portable key unit. Further, with the EEPROM also being separated from the portable key unit K, the processing for fingerprint registration need not be present in the portable key unit. Support for Figure 30(d) is specifically set forth in the originally-filed application when the Applicant further notes that "the sensor unit A can be on the card K (controller) or otherwise." (See Application, page 52, lines 1-2).

d) **Figure 30(e):**

Fourth, Figure 30(e) illustrates an embodiment wherein the portable key unit K includes the sensor, the processing for fingerprint encoding, the processing for fingerprint registration, and the EEPROM but not the processing for fingerprint matching. The matching is carried out

Serial No. 09/367,630

by the processor on the data receiving side. Support for Figure 30(e) is specifically set forth in the originally-filed application when the Applicant notes:

The system can also be set up in such a way that the card K (controller) carries out the fingerprint code creation and fingerprint code registration, and the matching is done on the data receiving side. In that case, the EEPROM 14 and HDD 15 need not be present on the data receiving side. (See Application, page 51, lines 20-25 (emphasis added)).

Because Applicant clearly sets forth the content of Figure 30(e) in the application, the addition of Figure 30(e) does not constitute new matter.

e) **Figure 30(f):** *not included*

Fifth, Figure 30(f) illustrates an embodiment similar to that of Figure 30(e), except the sensor is separated from the portable key unit, and as such, the fingerprint encoding is no longer performed on the key unit side. Support for Figure 30(f) can be specifically found in the originally-filed application from the above-quoted passage on page 51, lines 20-25 along with the passage on page 52, lines 1-2 wherein Applicant notes that the sensor need not be included in the portable key unit.

f) **Figure 47:** *not included*

Lastly, Figure 47 illustrates an embodiment wherein a plurality of matching circuits B perform fingerprint match determinations in parallel. Support for Figure 47 is specifically set forth in the originally-filed application:

In this application mode, we have so far discussed only the case in which only one matching circuit B is used. However, more than one matching circuit B may be provided if a large number of registered fingerprint codes have to be handled. In that case, the system is set up so that the offered fingerprint pattern is fed for verification to each of the matching circuits B and if a "Yes" signal is output from any one of the circuits B, then a "Yes" signal is sent to the control circuit C. If there is no "Yes" signal sent from any of the matching circuits B, a "No" signal is sent to the control circuit C. In this manner, the processing can be speeded up and the response time, from the point when the sensor 100 is pressed to the time of locking or unlocking of the concerned object E, can be reduced. (See Application, page 18, line 25-page 19, line 8 (emphasis added)).

As noted below, parallel implementation of the matching circuits is supported by the passage noting that fingerprint patterns are offered to "each" of the matching circuits. Because

Serial No. 09/367,630

Applicant clearly sets forth the content of Figure 47 in the application, the addition of Figure 47 does not constitute new matter.

II. *The claims satisfy §112, paragraph 1 because the specification describes the claimed subject matter in such a way that reasonably conveys to one skilled in the art that the inventors had possession of the claimed invention at the time of filing.*

The February 14, 2002 Office Action contends that claims 15, 17, 20, 21, 32, 33, 36, and 37 fail to satisfy section 112, first paragraph because the specification describes the claimed subject matter in such a way that reasonably conveys to one skilled in the art that the inventors had possession of the claimed invention at the time of filing. However, Applicant respectfully disagrees for the reasons set forth below.

Further, an objection was made to the drawings under 1.83(a) for failing to disclose the limitations in claims 15, 17, 20, 21, 32, 33, 36, and 37. The above-described new figures 30(b)-30(f) and 47 are submitted to overcome this objection. As set forth above, each of these figures finds support in the originally-filed application.

a) Claim 15:

112/151

Claim 15 recites an embodiment wherein the portable key unit comprises the processor configured to perform fingerprint match determinations, but not the sensor, not the semiconductor memory device, and not the control unit. Figure 30(d) illustrates an example of such an embodiment. As noted above in connection with Figure 30(d), the originally-filed application supports an embodiment wherein the portable key unit performs the match processing while the fingerprint sensing encoding, registration, and storage are located separate from the key unit. (See Application, page 51, line 7-page 52, line 2). Because the disclosure on pages 51 and 52 reasonably convey to a person of ordinary skill in the art that the inventors possessed the invention defined by claim 15, Applicant respectfully submits that the section 112, first paragraph rejection of claim 15 should be withdrawn.

b) Claims 17 and 21:

Claims 17 and 21 recite embodiments wherein the portable key unit comprises the sensor and the processor configured to perform fingerprint match determinations, but not the semiconductor memory device. Figure 30(c) illustrates an example of such embodiments. As

stated above in connection with Figure 30(c), the originally-filed application supports claim 17. (See Application, page 51, line 7 – page 52, line 2).

There can be a matching circuit on the data receiving side of the controller also, as shown in Figure 30. In that case, it can be set up so that the data transmission side, i.e., the card K, carries out only the preparation of fingerprint codes while the processing of fingerprint code registration and matching are done on the data receiving side. In this case, the EEPROM 14 of the card K need not be present. The system can also be set up in a way that the card K carries out only the fingerprint code preparation and matching processes and not the fingerprint registration. (See Application, page 51, lines 7-19 (emphasis added))

Because the disclosure on pages 51 and 52 reasonably convey to a person of ordinary skill in the art that the inventors possessed the invention defined by claims 17 and 21, Applicant respectfully submits that the section 112, first paragraph rejection of claims 17 and 21 should be withdrawn.

b) **Claims 20 and 42:**

still 112, 1st

Claims 20 and 42 recite an embodiment wherein the portable key unit comprises the semiconductor memory device but not the sensor and not the processor. Figure 30(f) is an example of such an embodiment. As explained above in connection with Figure 30(f), the originally-filed application supports claims 20 and 42 by describing, in connection with an embodiment where the EEPROM is on the key unit side, the fingerprint match determination is not performed on the key unit side, and the sensor can be on either side. (See Application, page 51, line 20 – page 52, line 2). Because the disclosure on pages 51 and 52 reasonably convey to a person of ordinary skill in the art that the inventors possessed the invention defined by claims 20 and 42, Applicant respectfully submits that the section 112, first paragraph rejection of claims 20 and 42 should be withdrawn.

c) **Claims 32 and 36:**

←

Claims 32 and 36 recite embodiments wherein a plurality of semiconductor memory devices and a plurality of processors are used to carry out fingerprint match determinations in parallel. Figure 47 illustrates an example of such embodiments. As stated above in connection with Figure 47, these limitations find clear support in the originally-filed application.

In this application mode, we have so far discussed only the case in which only one matching circuit B is used. However, more than one matching circuit B may be provided if a large number of registered fingerprint codes have to be handled. In that case, the system is set up so that the offered fingerprint pattern is fed for verification to each of the matching circuits B and if a "Yes" signal is output from any one of the circuits B, then a "Yes" signal is sent to the control circuit C. If there is no "Yes" signal sent from any of the matching circuits B, a "No" signal is sent to the control circuit C. In this manner, the processing can be speeded up and the response time, from the point when the sensor 100 is pressed to the time of locking or unlocking of the concerned object E, can be reduced. (See Application, page 18, line 25-page 19, line 8 (emphasis added)).

Thus, by disclosing that the fingerprint pattern is provided to each of the matching circuits, Applicant clearly discloses to one of ordinary skill in the art that the fingerprint match determinations will be performed in parallel. This parallel processing is further evidenced by a positive match being found if a "yes" signal is produced by any of the matching circuits. Because the disclosure on pages 18 and 19 reasonably convey to a person of ordinary skill in the art that the inventors possessed the invention defined by claims 32 and 36, Applicant respectfully submits that the section 112, first paragraph rejection of claims 32 and 36 should be withdrawn.

d) Claims 33 and 37:

Claims 33 and 37 recite an embodiment wherein fingerprint match determinations that result in a perfect match being found are rejected as negative. Claims 33 and 37 have been amended to clarify that the comparison is made between the fingerprint data created from the sensed fingerprint and the registered fingerprint data, as opposed to a direct comparison between the sensed fingerprint data and the registered fingerprint data. Support for this embodiment can be found in the originally-filed application on page 20 line 20 through page 21, line 2. Given the clear description of this feature of the invention on pages 20 and 21, and given the fact that the figures disclose the fingerprint matching program 18 executed by DSP 12 in carrying out fingerprint match determinations, Applicant submits that a new drawing showing this feature of the invention is unnecessary. Further, because the disclosure on pages 20 and 21 reasonably convey to a person of ordinary skill in the art that the inventors possessed the invention defined by claims 33 and 37, Applicant respectfully submits that the section 112, first paragraph rejection of claims 33 and 37 should be withdrawn.

e) New claims:

New claims 43 and 44 (which recite that the portable key unit includes the sensor and the semiconductor memory device but not the processor) finds support in the originally-filed application for the same reasons that Figure 30(e) finds support therein (see arguments above relating to Figure 30(e)).

→ 112, 157
VS = New claim 45 (which recites that the portable key unit comprises the matching processor but not the sensor and not the semiconductor memory device finds support in the originally-filed application for the same reasons that claim 15 and Figure 30(d) finds support therein (see arguments above relating to claim 15 and Figure 30(d)).

Support for the embodiments set forth in new claims 46-49 can be found on pages 51-52 wherein the distribution of various tasks are discussed (see Figure 30(a) and arguments illustrating support for Figures 30(c), (d), (e), and (f)).

III. The claims are patentable over the cited prior art because the cited prior art fails to teach or suggest all aspects of the claimed invention to one of ordinary skill in the art.

In the February 14, 2002 Office Action, (a) claims 11-12, 14, 19, 30, 31, 24, 40, and 42 were rejected for obviousness based on a combination of the Bowker and Tamori references, (b) claims 13 and 23 were rejected for obviousness based on a combination of the Bowker, Tamori, and Gullman references, (c) claims 16 and 22 were rejected for obviousness based on a combination of the Bowker, Tamori, and Kinoshita references, (d) claims 34 and 38 were rejected based on a combination of the Bowker, Tamori, and Moses references, (e) claims 35 and 39 were rejected based on a combination of the Bowker, Tamori, and Gokcebay references, and (f) claims 35, 39, and 41 were rejected based on a combination of the Bowker, Tamori, and Cockburn references. Applicant respectfully submits that the claims are patentable over the cited references for the reasons set forth below.

a) Claims 12, 31, and 40 are patentable over the Bowker/Tamori combination because the Bowker/Tamori combination fails to teach or suggest a portable key unit separated from a locking mechanism/starting switch that comprises a sensor for detecting a fingerprint pattern, a semiconductor memory for storing registered fingerprint data, and a processor for performing a fingerprint match determination.

Claim 12 recites a portable key unit separated from a locking mechanism that comprises a sensor for detecting a fingerprint pattern, a semiconductor memory for storing

Serial No. 09/367,630

registered fingerprint data, and a processor for performing a fingerprint match determination, but not a control unit for controlling the locking/unlocking of the locking mechanism in response to the fingerprint match determination. Claims 31 and 40 include similar limitations.

On this point, the Tamori reference fails to disclose any configuration for a portable key unit in a locking device because the Tamori reference is directed toward a fingerprint sensor, but not other portions of the locking device.

Bowker discloses a system wherein fingerprint templates needed for comparison with an offered fingerprint are "fetched from a remote computer, or from an identification card carried by the user and inserted into a local card reader." (See Bowker, column 22, line 66 – col. 23, line 6). The analyzer portion of the Bowker system, which carries out fingerprint match determinations, is shown to be part of the locking mechanism (see Fig. 10 which is described as a configuration wherein the analyzer is part of a rotatable doorknob wherein a certain fiber-prism installation is used. (See Bowker, "Brief Description of the Drawings"). While Bowker discloses that its system is amenable to miniaturization, no portability of the sensor and analyzer are taught or suggested. In all implementations taught by Bowker, the analyzer and sensor are not separated from the locking mechanism and are therefore not portable. (See Bowker, column 24, lines 61-66).

Therefore, because Bowker and Tamori fail to disclose a system wherein a portable key unit comprises a sensor, a processor, and a memory, Applicant respectfully submits that claims 12, 31, and 40 are not rendered obvious by the Bowker/Tamori combination.

b) Claims 11 and 19 are patentable over the cited references because the cited references fail teach or suggest all limitation of claims 11 and 19.

Claim 11 recites that the portable key unit may take any of 5 forms – (1) the portable key unit may comprise the sensor, the semiconductor memory, and the processor, but not the control unit (as specifically set forth in claim 12), (2) the portable key unit may comprise the sensor and the processor, but not the semiconductor memory, and not the control unit (as specifically set forth in claim 17), (3) the portable key unit may comprise the processor, but not the sensor, not the semiconductor memory, and not the control unit (as specifically set forth in claim 15), (4) the portable key unit may comprise the sensor and the semiconductor memory device, but not the processor, and not the control unit (as specifically set forth in claim 44),

Serial No. 09/367,630

and (5) the portable key unit may comprise the the semiconductor memory device, but not the sensor, not the processor, and not the control unit (as specifically set forth in claim 50)

As for portable key unit configuration (1) of claim 11, the prior art fails to teach this combination for the same reasons set forth above in connection with claims 12, 31, and 40.

As for portable key unit configuration (2), claim 17 -- which specifically addresses this configuration -- has not been rejected on any prior art. Further, as explained in sections I and II by Applicant, claim 17 is complies with section 112 first paragraph.

As for portable key unit configuration (3), claim 15 -- which specifically addresses this configuration -- has not been rejected on any prior art. Further, as explained in sections I and II by Applicant, claim 15 is complies with section 112 first paragraph.

As for portable key unit configuration (4), claim 44 -- which specifically addresses this configuration -- is not taught or suggested by the cited prior art because the prior art fails to teach a portable key unit that comprises the sensor and the semiconductor memory device, but not the processor, and not the control unit. Further, as explained in sections I and II by Applicant, such a configuration is amply supported by the originally-filed specification.

As for configuration (5), ~~claim 50~~ which specifically addresses this configuration -- corresponds with claim 20. Claim 20 was not rejected on the basis of prior art. As such, Applicant submits that the cited prior art fails to render claim 20 obvious. Further, as set forth in sections I and II by Applicant, because configuration (5) is supported by the originally-filed application, claim 50 is patentable.

Because each configuration of the portable key unit encompassed by claim 11 is not taught or suggested by the prior art, Applicant submits that claim 11 is non-obvious over the cited prior art.

Applicant submits the same arguments with respect to claim 19 which includes similar limitations with respect to the portable key unit.

c) Claims 16 and 22 are patentable over the Bowker/Tamor/Kinoshita combination because the Bowker/Tamori/Kinoshita combination fails to teach or suggest the use of one processor for fingerprint match determinations and another processor for fingerprint registration operations, wherein either the matching processor or the registration processor are part of a portable key unit, but not both.

Claims 16 and 22 require two processors -- a first processor for fingerprint match determinations and a second processor for fingerprint registrations on behalf of authorized

persons. The portable key unit can house either, but not both of the processors. Claims 46-49 set out each permutation of such an arrangement for a locking device and a switching device. Applicant respectfully submits that the Bowker/Tamori/Kinoshita combination fails to teach or suggest these limitations.

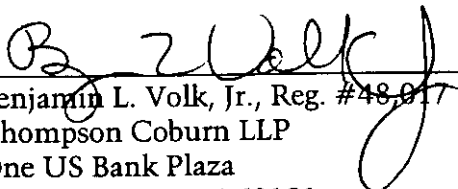
The Examiner, while acknowledging that Bowker and Tamori fail to teach such use of the two claimed processors, contends that the Kinoshita reference teaches the use of matching processor on the lock-side and a registration processor (presumably card control part 3 of the Kinoshita Figure 1) on the portable side. However, Applicant submits that the Kinoshita reference fails to disclose the teaching put forth by the Examiner. No statement is discernible as to what tasks are performed by the card control part 3. Particularly, no statement is discernible that would lead one of ordinary skill in the art to believe that the card control unit 3 carries out fingerprint registration. The English abstract of the Kinoshita reference discloses that the "device is provided with a finger feature input part 1 to input the feature of the finger to an ID card unit 8 carried by the entering/leaving person, finger feature storage part 2, card control part 3 and card communication part 5 or the like." Such a disclosure fails to sufficiently set forth to one of ordinary skill in the art that "card control part 3" performs fingerprint registration. As such, Applicant respectfully submits that the Bowker/Tamori/Kinoshita combination fails to render claims 16, 22, and 46-49 obvious.

Conclusion:

For the reasons set forth above in sections I and II, the new figures are supported by the originally-filed application and do not constitute new matter. Further, as set forth above, the claims comply with section 112, first paragraph. Further, as to independent claims 11, 16, 19, 22, and 40 (and all claims depending therefrom) no obviousness exists with respect to the prior art as explained above in section III. The prior art fails to teach or suggest all limitations recited therein. Further, Applicant asserts that independent claims 32-33 and 36-37 comply with section 112, first paragraph for the reasons set forth in sections I and II, and further notes that no prior art rejections have been made thereon. As such, Applicant also submits that claims 32-33 and 36-37 are allowable.

Serial No. 09/367,630

Favorable action is respectfully requested.



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MARKED-UP COPY OF AMENDED CLAIMS

(additions underlined; deletions bracketed)

11. (twice amended) A locking device comprising:
- (a) a locking mechanism for locking and unlocking movement of an object;
 - (b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;
 - (c) a semiconductor memory device for storing registered fingerprint data;
 - (d) a processor configured to determine by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said fingerprint sensor matches with any of the registered fingerprint data stored in said semiconductor memory device; [and]
 - (e) a control unit for controlling whether said locking mechanism locks or unlocks movement of said object in response to said fingerprint match determination by said processor; and
 - (f) a portable key unit separated from said locking mechanism, said portable key unit comprising one of the group consisting of: (1) said sensor, said semiconductor memory device, and said processor but not said control unit, (2) said sensor and said processor but not said semiconductor memory device and not said control unit, (3) said processor but not said sensor, not said semiconductor memory device, and not said control unit, (4) said sensor and said semiconductor memory device but not said processor and not said control unit, and (5) said semiconductor memory device, but not said sensor, not said processor, and not said control unit.

12. (twice amended) The locking device of claim 11 wherein ~~[further comprising a~~ portable key unit separated from said locking mechanism for communicating to said control ~~unit how to control said locking mechanism according to said fingerprint match determination by said processor,~~ said portable key unit comprises [comprising] said sensor, said processor, and said semiconductor memory device but not said control unit.

Serial No. 09/367,630

15. (twice amended) The locking device of claim 11 wherein ~~[further comprising a~~
~~portable key unit separated from said locking mechanism]~~ said portable key unit comprises
[comprising] said processor but not said sensor, not said semiconductor memory device, and
not said control unit ~~[any of said components (b), (c), or (e)].~~ (3)

16. (twice amended) A locking device comprising: [The locking device of claim 11,
wherein said processor is]

- (a) a locking mechanism for locking and unlocking movement of an object;
- (b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising
at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an
x-direction and a y-direction when said finger is pressed against said sensor;
- (c) a semiconductor memory device for storing registered fingerprint data;
- (d) a first processor configured to determine by electronic processing whether the
fingerprint data created from the fingerprint pattern detected by said fingerprint sensor
matches with any of the registered fingerprint data stored in said semiconductor
memory device; ~~[wherein said locking device further comprises]~~
- (f) a second processor in communication with said first processor and said
semiconductor memory device, said second processor being configured to register an
authorized person by storing in said semiconductor memory device fingerprint data
created from said fingerprint pattern of said authorized person and detected by said
sensor;
- (e) a control unit for controlling whether said locking mechanism locks or unlocks
movement of said object in response to said fingerprint match determination by said
processor; and
- (f) ~~[and wherein said locking device further comprises]~~ a portable key unit separated
from said locking mechanism, said portable key unit comprising either (i) said first
processor and said sensor but not said second processor, or (ii) said second processor
and said sensor but not said first processor.

17. (twice amended) The locking device of claim 11 wherein ~~[further comprising a~~
~~portable key unit separated from said locking mechanism]~~ said portable key unit comprises (2)

Serial No. 09/367,630

[comprising] said sensor and said processor but not said semiconductor memory device and not said control unit ~~[any of said components (c) or (e)]~~. (2)

18. CANCELED

11 // 19. (twice amended) A switching device comprising:
(a) a starting switch for starting operation of an object;
(b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;
(c) a semiconductor memory device for storing registered fingerprint data; [and]
(d) a processor configured to (1) determine by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said sensor matched with any of the registered fingerprint data stored in said semiconductor memory device and (2) actuate said starting switch in response to said fingerprint match determination being positive; and
(e) a portable key unit separated from said starting switch, said portable key unit comprising one selected from the group consisting of: (1) said sensor, said semiconductor memory device, and said processor, (2) said sensor and said processor but not said semiconductor memory device, (3) said processor but not said sensor and not said semiconductor memory device, (4) said sensor and said semiconductor memory device but not said processor, and (5) said semiconductor memory device, but not said sensor and not said processor.

20. (twice amended) The switching device of claim 19 wherein [further comprising a portable key unit separated from said starting switch,] said portable key unit comprises [comprising] said semiconductor memory device but not said sensor [or] and not said processor. (5)

21. (twice amended) The switching device of claim 19 wherein [further comprising a portable key unit separated from said starting switch,] said portable key unit comprises [comprising] said sensor and said processor but not said semiconductor memory device. (2)

16 22. (amended) A switching device comprising: [The switching device of claim 19 wherein said processor is]

- (a) a starting switch for starting operation of an object;
- (b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;
- (c) a semiconductor memory device for storing registered fingerprint data;
- (d) a first processor configured to (1) determine by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said sensor matched with any of the registered fingerprint data stored in said semiconductor memory device and (2) actuate said starting switch in response to said fingerprint match determination being positive; [, wherein said switching device further comprises];
- (e) a second processor in communication with said first processor and said semiconductor memory device, said second processor being configured to register an authorized person by storing in said semiconductor memory device fingerprint data created from said fingerprint pattern of said authorized person and detected by said sensor; and [, and wherein said switching device further comprises];
- (f) a portable key unit separated from said starting switch, said portable key unit comprising either (i) said first processor and said sensor but not said second processor, or (ii) said second processor and said sensor but not said first processor.

25. CANCELED

26. CANCELED

27. CANCELED

28. CANCELED

29. CANCELED

30. CANCELED

31. (amended) The switching device of claim 19 wherein [further comprising a portable key unit separated from said starting switch for communicating to said starting switch whether said starting switch is to be actuated according to said fingerprint match determination by said processor,] said portable key unit comprises [comprising] said sensor, said semiconductor memory device, and said processor. (11) of 11

diff. → 32. (amended) A locking device comprising: = 11 diff. from 11

(a) a locking mechanism for locking and unlocking movement of an object;

(b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;

semiconductor memory (c) a plurality of semiconductor memory devices for storing registered fingerprint data;

→ a processor (d) a plurality of processors in communication with said plurality of semiconductor memory devices, said plurality of processors being configured to determine in parallel by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said fingerprint sensor matches with any of the registered fingerprint data stored in said semiconductor memory devices;

(e) a control unit for controlling whether said locking mechanism locks or unlocks movement of said object in response to said fingerprint match determination by said processor 112 2nd no anten.

[The locking device of claim 11 further comprising a plurality of said processors and a plurality of said semiconductor memory devices, said plurality of processors and said plurality of semiconductor memory devices being configured to perform said fingerprint match determinations in parallel.] 112 2nd

11 33. (amended) A locking device comprising: [The locking device of claim 11 wherein said processor is]

- (a) a locking mechanism for locking and unlocking movement of an object;
(b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;
(c) a semiconductor memory device for storing registered fingerprint data;
(d) a processor configured to determine by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said fingerprint sensor matches with any of the registered fingerprint data stored in said semiconductor memory device, said processor being further configured to make a negative fingerprint match determination if said [sensed] fingerprint data created from the fingerprint pattern detected by said sensor perfectly matches any of said registered fingerprint data; 11/2, 2nd
and
(e) a control unit for controlling whether said locking mechanism locks or unlocks movement of said object in response to said fingerprint match determination by said processor.

6-11-19
36. (amended) A switching device comprising: [The switching device of claim 19 further comprising a plurality of said processors and a plurality of said semiconductor memory devices, said plurality of processors and said plurality of semiconductor memory devices being configured to perform said fingerprint match determinations in parallel]

- (a) a starting switch for starting operation of an object;
(b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;
(c) a plurality of semiconductor memory devices (for storing registered fingerprint data); and
(d) a plurality of processors configured to (1) determine in parallel by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said sensor matched with any of the registered fingerprint data stored in said semiconductor memory devices and (2) actuate said starting 11/2, 2nd
no antiselect
basis

switch in response to any of said fingerprint match determinations being positive.

37. (amended) A switching device comprising: [The switching device of claim 19 wherein]

- (a) a starting switch for starting operation of an object;
- (b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;
- (c) a semiconductor memory device for storing registered fingerprint data; and
- (d) a processor configured to (1) determine by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said sensor matched with any of the registered fingerprint data stored in said semiconductor memory device, (2) [said processor is further configured to] make a negative fingerprint match determination if said [sensed] fingerprint data created from the fingerprint pattern detected by said sensor perfectly matches any of said registered fingerprint data, and (3) actuate said starting switch in response to said fingerprint match determination being positive.

40.

(amended) A lock[-] and switch controlling system comprising:

- (a) a locking mechanism for locking and unlocking movement of [an] a first object;
- (b) a starting switch in circuit with a second object, said starting switch being operable to connect or disconnect power to said second object;
- (c) a control circuit for controlling whether said locking mechanism locks or unlocks movement of said first object;
- (d)[(c)] a semiconductor memory device for storing registered fingerprint data;
- (e)[(d)] a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor; [and]
- (f)[(e)] a processor configured to (1) create sensed fingerprint data from said fingerprint pattern detected by said sensor, (2) determine whether a fingerprint match exists by

comparing said sensed fingerprint data with said registered fingerprint data, and (3) actuate said control circuit in response to said fingerprint match determination being positive, said processor being in communication with said semiconductor memory device, said sensor, and said control circuit; and

(g) a portable key unit separated from said locking mechanism, said control circuit, and said starting switch, said portable key unit comprising said processor, said sensor, and said semiconductor memory device.

41. CANCELED

42. (amended) The locking device of claim 11 wherein ~~[further comprising a portable key unit separated from said locking mechanism,]~~ said portable key unit comprises [comprising] said semiconductor memory device but not said sensor, not said processor, and not said control unit [and wherein said processor is further configured to compare the fingerprint data created from the fingerprint pattern detected by said fingerprint sensor with the registered fingerprint data stored in said semiconductor memory device when unlocking is needed]. (S)

43. (new) The locking device of claim 11 wherein said portable key unit comprises said sensor and said semiconductor memory device, but not said processor and not said control unit. (4)

44. (new) The switching device of claim 19 wherein said portable key unit comprises said sensor and said semiconductor memory device but not said processor. (4)

45. (new) The switching device of claim 19 wherein said portable key unit comprises said processor but not said sensor and not said semiconductor memory device. (2)

46. (new) The locking device of claim 16 wherein said portable key unit comprises said first processor and said sensor but not said second processor.

Serial No. 09/367,630

47. (new) The locking device of claim 16 wherein said portable key unit comprises said second processor and said sensor but not said first processor.
48. (new) The switching device of claim 22 wherein said portable key unit comprises said first processor and said sensor but not said second processor.
49. (new) The switching device of claim 22 wherein said portable key unit comprises said second processor and said sensor but not said first processor.

Serial No. 09/367,630

MARKED-UP COPY OF AMENDED SPECIFICATION PARAGRAPH ON PAGE 9

EXTENDING FROM LINES 20-21:

(additions underlined, deletions bracketed)

Figures [Figure] 30(a)-(f) depict diagrams [depicts a diagram] showing [an] various alternative structures [structure] for the lock depicted in Figure 29.